TROPENTAG 2017
Conference theme: Future Agriculture: Social-ecological transitions and bio-cultural shifts 20 - 22, 2017, University of Bonn, Germany

Factors Affecting the Adoption of Forage Technologies under Smallholder Dairy Production Systems in Tanzania

Hycenth T. Ndah[a,d], Johannes Schuler[a], Birthe K. Paul[b], Beatus Nzogela[b], Walter Mangesho[c], Richard Mollel[c], Rose Loina[c], Venance Kengwa[b]

[a] *Leibniz Centre for Agricultural Landscape Research (ZALF), Müncheberg, Germany*

[b] *International Center for Tropical Agriculture (CIAT), Nairobi, Kenya*

[c] *Tanzania Livestock Research Institute (TALIRI), Tanga, Tanzania*

[d] *University of Hohenheim, Institute of Social Sciences in Agriculture, Department of Rural Sociology, Stuttgart, Germany*

Introduction

- 70% of the world's bovines belongs to LDCs, but they only produce **29%** of the global meat and **23%** of the global milk output (Jahnke et al. 1988).
- Current demand for dairy products in Africa largely outweigh their production (Smith 2015; Lukuyu et al. 2009).
- A comparative study showed a 4.0% demand growth rate against a 3.1% production growth rate of dairy products in SSA between 1990 and 2004 (Ndambi et al. 2007),
  - While, at the same period, Africa's dairy imports grew at a rate of 2.1% per annum.
- Numbers demonstrate that SSA's dairy production potential is **yet to be reached**.

(c)Paul Karaimu ILRI

Problem statement

- For over 40 years, researchers have tested and introduced improved forage varieties (IFVs) aiming at improving cattle's productivity in SSA.
- However, its adoption by smallholder livestock farmers has proven to be unsatisfactory.
- Despite heavy sensitization on IFVs in East Africa only 10% of smallholder farmers had taken them up by 2005 (Franzel and Wambugu 2007).

One question remains:

➢ *Why are smallholder dairy farmers in SSA and Tanzania in particular not adopting IFVs to improve performance of their dairy cows?*


Napier Kakamega


Greenleaf desmodium


Napier grass, (local variety)


Napier grass (hybrid variety)

Purpose and objectives of study

- This study aimed at identifying opportunities and constraints for the adoption of IFVs in smallholder dairy production systems in SSA with a special focus on **Lushoto, Tanzania.**

Specifically, it examines:

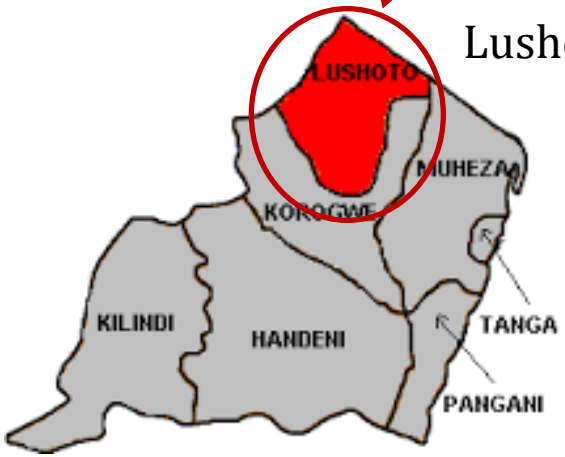
- the institutional, socio-economic, policy, cultural, local gender rules and dimensions in place and,
- how these all influence the wider adoption and diffusion process of IFVs in SSA with a special focus on **Lushoto.**

Location of Lushoto

Africa

Tanga district, Tanzania

Lushoto in Tanga district



General background of Lushoto

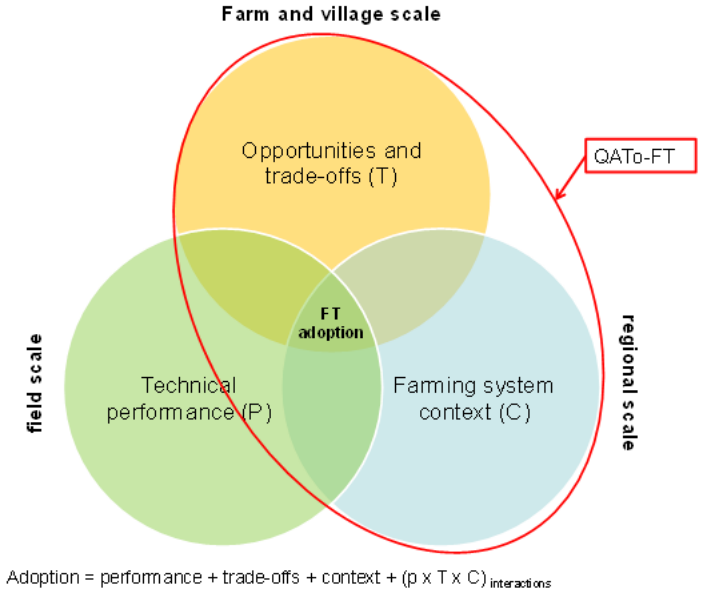
- Temp. ranges between 18-23^{0}C,
- Annual precip. ranges between 600 to 2000mm.
- In 1998 population exceeded 400.000 pers. and was still growing at a rate of between 2.2 and 2.8% per annum, and presently has 50 and 250 persons/km^2.
- Characterized by steep slopes and protected forests, there is a stiff competition for arable land in the district.
- Agriculture is dominated by smallholders (about 90%), owning extremely small farm sizes, and who operate on very low budgets.
- More than 80 % of the people in Lushoto are living below the poverty line with less than US$2 per day.

(Jambiya 1998; Sijmons et al. 2013)

Methodology

- Empirical data for this study is based on **semi-structure qualitative interviews** and the application of a **Qualitative Assessment tool for Forage Technology (QATo-FT)** in a one day multi-stakeholder learning workshop.
- Secondary data was obtained from a comprehensive literature study, aimed at examining issues of general livestock production and forage adoption across the entire SSA region.

Scales of coverage of QATo-FT



(adapted from Corbeels et al. 2012).

Thematic categories of QATo-FT

	Category
A	Object of Adoption (IFVs)
B	Farm and household characteristics/constraints
C	Capacity of implementing institution
D	Attributes of dissemination strategy
E	Political/Institutional framework at village Level
F	Political/Institutional framework at regional Level
G	FT products and inputs market conditions
H	Perception of community towards IFVs
I	Knowledge of IFVs role on climate change and other ecological benefits

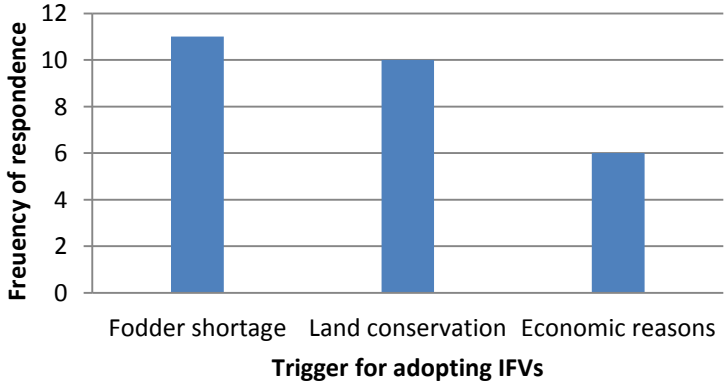
Findings: interviews and farm visits

Main triggers to actual adoption of IFVs at farm/household level

- Shortage of feed for cows especially during the dry seasons,
- soil conservation problems,
- ➢ However, expected economic advantages were not as dominant in the farmers' responses.

Main reasons for sustaining actual adoption IFVs at farm/household level

- Chances of a year round availability of fodder, under IFVs,
- increased fodder demand (due to higher livestock numbers),
- accumulated benefits (e.g. increased animal numbers and forage yields),
- ➢ However, soil conservation issues were mentioned less often, in contrast to their dominance as triggering factors.



Findings: interviews and farm visits

Main hindering factors to actual adoption at farm/household level

- general lack of knowledge on the stabilizing effect of forage production on milk yields,
- the low value of labour in the dry season resulting in farmers engaging in labour intensive, long-distance cut-and-carry feeding, as well as
- limited access to existing dairy markets creating a bottleneck between producers and consumers.

Findings: QATo-FT assessment

Relative adoption potential

- *Out of the 9 assessed thematic categories of QATo-FT and their influence on adoption potential,*
- *At least 4 categories in each of the two villages assesssed, achieved an RT score of over 80%,*
- *though there appears to be variations in the types and scores achieved across the villages (e.g Mbuzii and Ubiri),*
- ***The general overall adoption potential (OP) of IFVs for Lushoto area is rated high.***

Results- UBIRI, village

	Thematic area (A….I)	Maximum possible points	Total points achieved	Percentage achieved (unweighted) (Points achieved/total points)	Percentage achieved (weighted with equal strength for each level)
A	Object of Adoption (FT) (ObjofAdoptFarmVillLev)	25	22	88%	88%
B	Farm and household characteristics/constraints (FarmHHcharac)	45	30	67%	67%
C	Capacity of implementing Institution (CapacityofImpInstVillRegLev)	30	29	97%	97%
D	Attributes of dissemination strategy (AttrOfDissemStraVillRegLev)	50	43	86%	86%
E	Political/Institutional framework (PolInstRegLev)	30	25	83%	83%
F	Political/Institutional framework (PolInstVillLev)	25	20	80%	80%
G	FT products and inputs market conditions (MarkCondVillRegLev)	25	24	96%	96%
H	Perception of community towards FT (PercepCommVillRegLev)	30	24	80%	80%
I	Knowledge of FT role on CC and other ecol. benefits (FTClimateEE)	15	15	100%	100%
	Total	275	**232**	**84%**	**86%**
				Relative Likelihood of adoption	

Results-MBUZII, village

	Thematic area (A….I)	Maximum possible points	Total points achieved	Percentage achieved (unweighted) (Points achieved/total points)	Percentage achieved (weighted with equal strength for each level)
A	Object of Adoption (FT) (ObjofAdoptFarmVillLev)	25	20	80%	80%
B	Farm and household characteristics/constraints (FarmHHcharac)	45	41	91%	91%
C	Capacity of implementing Institution (CapacityofImpInstVillRegLev)	30	25	83%	83%
D	Attributes of dissemination strategy (AttrOfDissemStraVillRegLev)	50	43	86%	86%
E	Political/Institutional framework (PolInstRegLev)	30	20	67%	67%
F	Political/Institutional framework (PolInstVillLev)	25	21	84%	84%
G	FT products and inputs market conditions (MarkCondVillRegLev)	25	19	76%	76%
H	Perception of community towards FT (PercepCommVillRegLev)	30	30	100%	100%
I	Knowledge of FT role on CC and other ecol. benefits (FTClimateEE)	15	14	93%	93%
	Total	275	**233**	**85%**	**84%**
				Relative Likelihood of adoption	

Findings: QATo-FT assessment

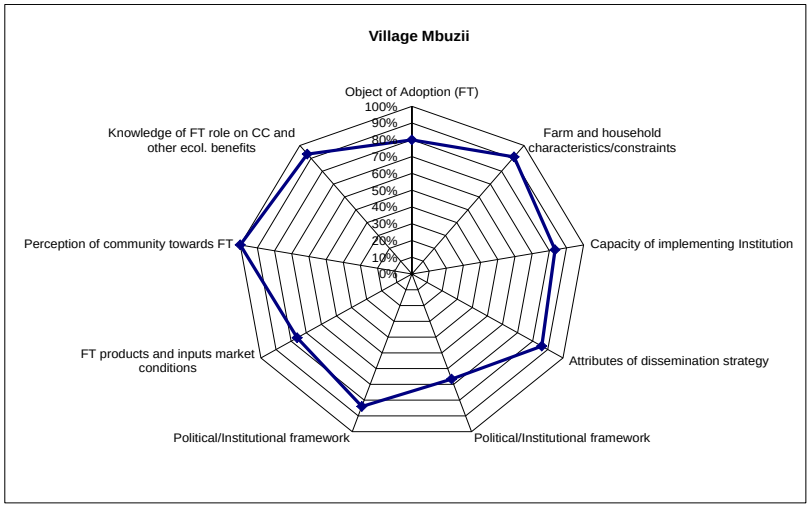
Relative adoption potential

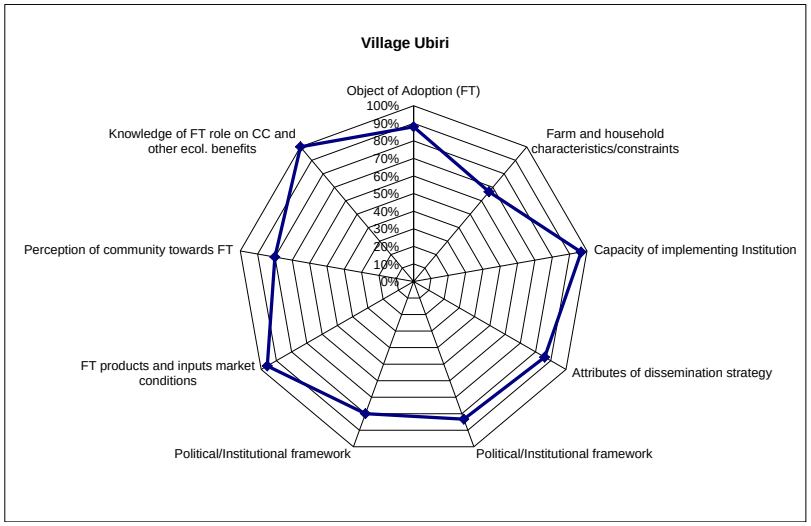
Thematic positive influence on adoption potential:

- ✓ receptive nature of the community towards the technology ,
- ✓ expectations of improved forages on ecological benefits,
- ✓ products and input market conditions around livestock production and improved forages,

Thematic negative influence on adoption potential:

- ✓ the political and institutional framework at regional level,
- ✓ products and input markets conditions ,
- ✓ farm/household characteristics.





Recommendations towards upscaling IFVs in Lushoto

⇒ **Knowledge awareness** and **exchange** on the benefits of IFVs, proper management, conservation and optimal utilization in livestock is needed, using participatory approaches.

⇒ Local and regional administration could assist in **strengthening partnerships** between involved stakeholders such as farmers, NGOs, service providers, extension officers and other networks beyond the existing innovation platforms.

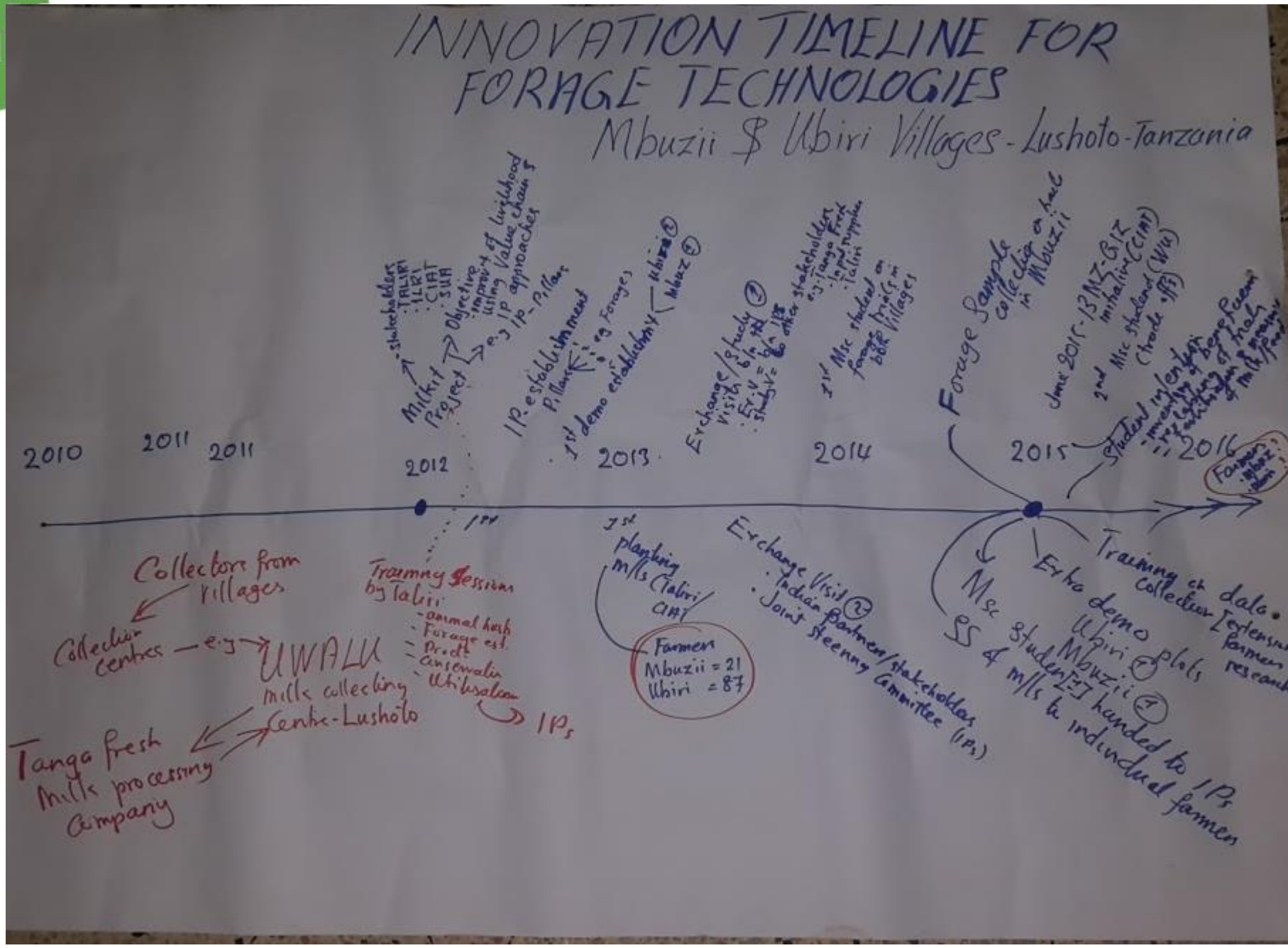
⇒ **Increasing** the **value of labour** through off-farm income possibilities could make IFV a necessary, labour-saving activity.

⇒ Creating **better access to existing markets** could generate an incentive for planting IFVs, hence supporting a higher milk production.

Conclusion

- The aforementioned actions hold the key to motivate small-scale dairy farmers' uptake of productive farm actions such as **improved forage technologies**.
- As a result, the **performance of existing heads** of cattle would improve, **milk yields would increase** and farmers' **income levels** could be enhanced, helping to reduce poverty in the region.

Asante sana!


INNOVATION TIMELINE FOR FORAGE TECHNOLOGIES
Mbuzii & Ubiri Villages - Lushoto - Tanzania
2010
2011
2011
2012
2013
2014
2015
2016
Collectors from villages
Collection centres — e.g. → UWALU milk collecting centre - Lushoto
Tanga Fresh Milk processing Company
Training Sessions by Tabiri
- animal husb
- Forage est.
- Prodt conservatn
- Utilisation
IPs
1st planning m/s (Tabiri CIAT)
Farmers
Mbuzii = 21
Ubiri = 87
Exchange Visit
Indian Partners/stakeholders
Joint Steering Committee (IPs)
Msc Students handed to IPs
SS & m/s to individual farmers
Extra demo plots
Ubiri
Mbuzii
Training on data collection
Extension
Farmer research
Forage sample collection on field in Mbuzii
June 2015 - 13 MZ-GIZ initiative (CIAT)
2nd Msc student (Chorde - IPs)
Student involvement in
Farmers